ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Invertebrate Abstract **Element Code:** IMGASJ0950
Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Pyrgulopsis bernardina*
COMMON NAME: San Bernardino Springsnail
SYNONYMS: *Yaquicoccus bernardinus, Pyrgulopsis cochisi, P. bernardenus*
FAMILY: Hydrobiidae

AUTHOR, PLACE OF PUBLICATION: D.W. Taylor. 1987. Fresh-water molluscs from New Mexico and vicinity. New Mexico Bureau of Mines & Mineral Resources. Bulletin 116: 34-36.

TYPE LOCALITY: Springs at San Bernardino Ranch, Cochise County, Arizona.

TYPE SPECIMEN: Holotype: LACM 2186. D.W. Taylor, 27 July 1968.

TAXONOMIC UNIQUENESS: This genus comprises 35 described species and an additional 20-25 undescribed species in the Southwest.

DESCRIPTION: Adult shell height (height from top of shell to bottom of shell) 1.3-1.7 mm. Shell is narrowly conical. Spire has 3.25 to 4.0 whorls. Operculum ("door" that appears when head/foot is withdrawn) is pale amber in color. Operculum attachment scar has a narrow discrete thickening all around, but leaves no conspicuous trace. Females are larger than males. Snout with light to dark dusting of pigment. Sides of head/foot somewhat less pigmented than snout. All hydrobioids have a foot with a rounded posterior end. Penis is simple, with no accessory lobe, bearing a large, long-oval glandular patch on a prominent lobule on both left dorsal and ventral surfaces.

AIDS TO IDENTIFICATION: Due to the small size of this animal, it cannot be identified to species in the field but must be identified in a laboratory by a qualified authority. Therefore, to obtain specimens, sift sand believed to contain the snail through an ordinary kitchen strainer. The rule of thumb that spring snail species are specific to a particular location (i.e. a single spring or group of springs connected or close to each other), may be used as a means of preliminary identification.

ILLUSTRATIONS: Line drawings (Taylor, 1987)
Line drawings (Hershler and Landye, 1988)
Scanning electron microscope micrographs of radula (Hershler and Landye, 1988)
Line drawings (Hershler and Ponder, 1998)

TOTAL RANGE: Single population in Cochise County, Arizona (Taylor 1987). "Restricted to type-locality and nearby small seeps at San Bernardino Ranch" (Hershler 1988).

RANGE WITHIN ARIZONA: See "**Total Range.**"

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The hydrobioid digestive system is typical of style-bearing neotaenioglossans. The mouth opens to a short oral area containing a pair of dorsolateral chitinous jaws composed of small, simple rodlets, immediately behind which is a well-developed buccal mass (situated within the snout). A pair of simple, unbranched, tubular salivary glands opens anterodorsally to the buccal cavity and (almost always) pass posteriorly over the nerve ring, rarely stopping short of the ring, but never passing through it in hydrobioids. Hydrobioids have a taenioglossate radula (i.e., seven teeth per row) comprising numerous rows of cuspate teeth, each of which includes a typically squarish or trapezoidal central tooth flanked on each side by lateral, inner marginal, and outer marginal teeth. Teeth near the anterior end of the radula are often worn or broken, whereas the proximal portion of the ribbon has several to many rows of poorly differentiated or incompletely formed teeth. (Hershler and Ponder, 1998).

REPRODUCTION: Most hydrobioids are oviparous, with females depositing small egg capsules, either singly or (rarely) in strings, on the substrate. A small number of hydrobioids are ovoviviparous, in which female's brood shelled young in the pallial gonoduct. Hydrobioid egg capsules are typically hemispherical to spherical. Copulation in hydrobioids is usually via an anterior opening to the glandular oviduct. The ventral channel may be traversed at least in part by the penis, but it is more likely that the penis only enters the anterior most section. (Hershler and Ponder, 1998).

FOOD HABITS:

HABITAT: "Spring about 100 ft southeast of an artificial pond and is probably fed in part by lateral underflow from that pond. The spring-brook was a watercress-choked stream about 1 ft wide, trickling over gravel, mud and dead wood and leaves. *Yaquicoccus* was abundant on dead wood, leaves or stones" (Taylor 1987).

ELEVATION: 3,860 ft. (1,177 m).

PLANT COMMUNITY: Unknown.

POPULATION TRENDS: Unknown.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: C (USDI, FWS 2007)
[None USDI, FWS 1996]
[C2 USDI, FWS 1994]
[C2 USDI, FWS 1991]

STATE STATUS: None

OTHER STATUS: Bureau of Land Management Sensitive
(USDI, BLM AZ 2000, 2005, 2008)
Forest Service Sensitive
(USDA, FS Region 3 1999)

MANAGEMENT FACTORS: **Threats:** highly restricted geographic distribution, with associated potential for extinction due to chance events; groundwater depletion and loss of spring flow. **Management needs:** prevent further loss or degradation of habitat; identify opportunities for translocation and reestablishment of former population.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS:

LAND MANAGEMENT/OWNERSHIP: Private - Johnson Historical Museum.

SOURCES OF FURTHER INFORMATION

REFERENCES:

Hershler, R. and J.J. Landye. 1988. Arizona Hydrobiidae (Prosobranchia: Rissoacea). Smithsonian Contributions to Zoology. Number 459: 41.

Hershler, R. and W.F. Ponder. 1998. A Review of Morphological Characters of Hydrobioid Snails. Smithsonian Institution Press, Washington D.C.

Malcom, J.W. et al. 2002. The San Bernardino Springsnail: Life History, Ecology, and Conservation. Meeting Resource Management Information Needs: Fourth Conference on Research and Resource Management in the Southwestern Deserts, Extended Abstracts.

NatureServe Explorer: An online encyclopedia of life [web application]. 2003. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: http://www.natureserve.org/explorer. (Accessed: November 18, 2003).

Taylor, D.W. 1987. Fresh-water molluscs from New Mexico and vicinity. New Mexico Bureau of Mines and Mineral Resources. Bulletin 116: 34-35.

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

USDI, Bureau of Land Management. 2000. Arizona BLM Sensitive Species List. Instruction Memorandum No. AZ-2000-018.

USDI, Bureau of Land Management. 2005. Arizona BLM Sensitive Species List.

USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 56(225): 58823.

USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. Federal Register 59(219): 59007.

USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40): 7596-7613.

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ADDITIONAL INFORMATION:

Independently described by Hershler and Landye (1988). Taylor (1987) takes precedence as his data was published one month earlier (Sally Stefferud, US Fish and Wildlife Service, pers comm. 1992). Hershler (pers comm. to S. Stefferud, 1991) indicated that Hershler believes the species he described, *Pyrgulopsis cochisi*, holotype, USNM 89055, J.J. Landye, 20 March 1971, to be separate and distinct from *Yaquicoccus bernardinus* described by Taylor (1987).

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2007-12-10 (TFH)

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